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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/623,588	10/30/2000	Wolfgang Ehrfeld	WEB 0039 PA	5063
7590 05/06/2004			EXAMINER	
Richard A Killworth Killworth Gottman Hagan & Schaeff One Dayton Centre Suite 500 One South Main Street Dayton, OH 45402-2023			WACHTEL, ALEXIS A	
			ART UNIT	PAPER NUMBER
			1764	
DATE MAILED: 05/06/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/623,588	Applicant(s) EHRFELD ET AL.	
	Examiner Alexis Wachtel	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-38 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20,24-27,37 and 38 is/are rejected.
- 7) ☒ Claim(s) 21-23 and 28-36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 20,26,27 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,326,537 to Cleary.

With regards to claim 20, Cleary teaches a method of operating a counterflow catalytic device in which one or more educt streams (36) are guided to at least one reaction region (15) and in which one or more product streams (37) are guided from the reaction region in counterflow relationship with the educt stream or streams and in thermal contact therewith, characterized in that to minimize heat losses from the reaction region to the surrounding area the educt stream or streams and the product stream or streams are guided spirally or radially in at least one plane respectively to or from the reaction region arranged in a central region of the microreactor.

With regards to claim 26, Cleary teaches a counterflow catalytic device for carrying out chemical reactions comprising one or more feed means (36) for educts and one or more discharge means (37) for products and at least one reaction region (15) connected to the feed and discharge means, wherein the discharge means are arranged in counterflow relationship with the one or more feed means and are in thermal contact therewith, characterized in that to minimize heat losses from the

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reaction region to the surrounding area the feed means (36) and the discharge means (37) or the plurality of feed means and the plurality of discharge means are arranged spirally or radially in at least one plane around the reaction region which is in a central region of the microreactor.

Per claim 27: characterized by a cylindrical central region (Fig.3) and a space which is of an annular configuration in cross-section and which surrounds it and which is divided into sectors, wherein alternate sectors of the space of an annular configuration serve as feed (13) and discharge means (25) respectively, wherein the sectors serving as a feed means are connected by way of the central region to the respective sectors serving as a discharge means, and wherein the central region and/or regions of the sectors serves or serve as a reaction region .

Per claim 38: characterized by catalytically active material which is possibly applied to a carrier, in the reaction region (Col 3, lines 36-39).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 25 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,326,537 to Cleary.

With regards to claims 25 and 37, Cleary as set forth above fails to teach that educt passages have a width in at least one region of $< 2\text{mm}$.

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However, the educt passage width is clearly a result effective variable. The maximum educt flow rate and internal pressure that the apparatus disclosed by Cleary can handle is largely a function of educt passage width. As a result one of ordinary skill could adjust the educt passage width to accommodate the desired educt flow rate and internal pressure of the apparatus through the process of routine experimentation.

Prior Art of Record

4. The prior art of record and not relied upon is considered pertinent to Applicant's disclosure. In addition, the following references are cited for disclosing various aspects of Applicant's invention:

US 5,405,586

Allowable Subject Matter

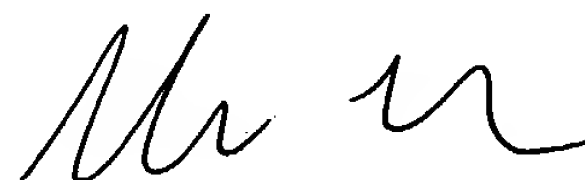
5. Claims 21-23,28-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With regards to claims 21-23,28-36 no prior art has been found to teach or suggest a reactor where a plurality of educt and product streams are guided radially, in a counterflow manner, to and from a central reaction region located in the center of the reactor. US 5,326,537 to Cleary teaches a microreactor with a central reaction region. However, educt and product streams are guided spirally rather than radially to and from the central reaction region. US 5,405,586 to Koves teaches a radial flow heat exchanging reactor. The reactor has alternating channels of reactant and heat exchanger fluid. The channels have no fluid communication. The heat exchanger fluid and reactant flow in opposite directions,

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however the apparatus of Koves is not capable of being configured so that reactants have a counterflow relationship with adjacent reactant streams and is therefore inapplicable as prior art.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Wachtel whose telephone number is 571-272-1455. The examiner can normally be reached on 10:30am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Glenn Caldarola, can be reached at (571)-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700